

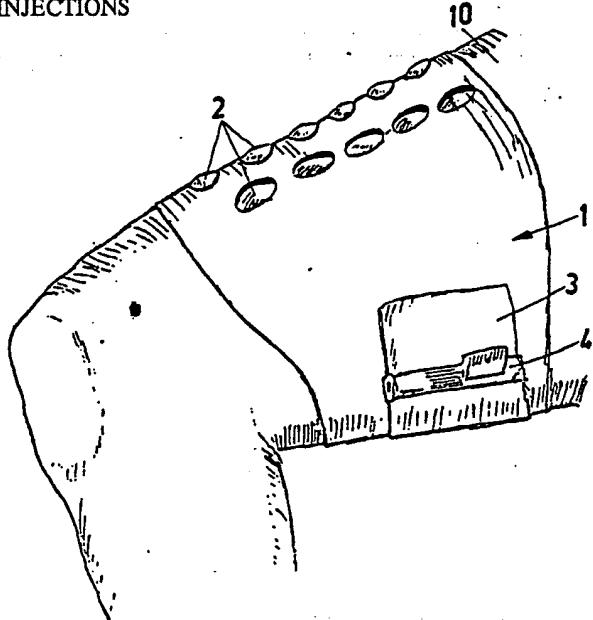
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/SE79/00137  (22) International Filing Date: 18 June 1979 (18.06.79)  (31) Priority Application Number: 7807024-0  (32) Priority Date: 20 June 1978 (20.06.78)  (33) Priority Country: SE  (71) Applicant; and (72) Inventor: BERGER, Johannes [SE/SE]; Wieselgrensplatsen 13 V, S-417 17 Göteborg (SE).		(81) Designated States: AT, CH, DE, DK, FR (European patent), GB, SU, US.  Published with: <i>International search report</i>

## (54) Title: MATRIX FOR INJECTIONS



## (57) Abstract

At daily injection of drugs, such as insulin, it is extremely important constantly to change the spot for injection and not to return to the same spot until after about a month. If you inject too often within the same area of skin there can easily appear damages to the skin such as cavities, indurations and witherings, which can result in the impaired resorption of the drug. The invention offers a possibility to distribute the spots for injection in a safe and simple way with the assistance of a matrix for injection (1) in the form of an elastic material which is cuffed around the area for injection, and the said matrix for injection (1) is provided with a number of holes (2), numbered after the days of the month and through which the injection is performed. The holes are peripherally edge-supported, and as a result of that a dome-shaped "tissue-cushion" appears when the matrix (1) is strapped, which facilitates the perforation by the needle and as a result reduces the sensitivity and promotes the resorption of the injected drug such as insulin.

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MATRIX FOR INJECTION

## DESCRIPTION

Background of the invention

The present invention refers to a matrix for injection as an auxiliary to avoid repeated injections on the same spot during a rather long period of time.

For certain diseases the patient is bound to inject  
5 a drug daily and in certain cases several times daily. Diabetes is such a disease for which insulin has to be injected daily, and the patient is usually instructed by the doctor or the nursing staff not to make the injection on the same spot at less interval than one  
10 month. This for avoiding dystrophies such as cavities, indurations and witherings, with an impaired resorption of insulin as a consequence. Especially patients who are old, forgetful and shaky in the hands have difficulties in following this recommendation from  
15 the doctor, and the injection has therefore hitherto been carried out "to the best of ability", which has had as a consequence in most cases that only a limited area of the skin has been used for the injection with disregard to the fact that the same area of skin needs  
20 substantial time for recovery.

The purpose of the invention and its most important features

The purpose of the present invention is to bring about an auxiliary for patients of the abovementioned kind, with the help of which the patient is



given a possibility in a guaranteed simple and safe way daily to change the spot for injection during several months so that the tissue can recover and side effects are prevented. This problem has been  
5 solved by the fact that the matrix for injection forms a bandshaped, flexible cuff of rubber, soft plastic or elastic woven material or the like, and that the cuff has a number of holes arranged in succession, and that the cuff has a quickfixing  
10 device attached to it made for loosable fixation of one of the bandformed ends of the band thus creating a closed loop around a part of the body.

Description of the drawing

The invention is described closer below with reference to the attached drawing, which shows a specimen.  
15

Picture 1 shows a lateral view of the matrix for injection in accordance with the invention properly placed for use around a thigh.

Picture 2 shows the matrix for injection according  
20 to picture 1 viewed from above.

Picture 3 shows on a larger scale a section through part of the matrix just in front of a number of holes and

Picture 4 shows in perspective the fixation device  
25 for tight locking of one of the bandparts of the matrix for injection.

Description of specimen

The matrix for injection forms a bandshaped, flexible cuff 1 of rubber, soft plastic or elastic woven material or the like.



The bandshaped cuff is at its one end end rather wide and equipped with a number of holes 2 and at the other end shaped as a thinner bandpart 3, which is intended to cooperate with a fixation device 4 attached to the wider bandpart in such a way that when the thinner bandpart 3 is put through the fixation device 4 a close loop is made. The holes of the matrix are arranged in a suitable number - in the specimen shown 16 - for example of three files symmetrically arranged along a median line A through the middle file of holes. At one side-edge of the matrix on each side of the median line A are arranged indication lines at half distance from the median line A and through which it is easy to see how much the cuff has to be moved - for instance half a file - for getting new injection positions for the matrix and as a result new spots for injection.

The locking device 4 is of type snaplock and consists of a holder 5 and an excentrically pivoted snap part 6, which together with the friction device 7 with the help of a handle 8 can be twisted closer or further away from the holder 5.

A bandpart 3 that is put through the space between the snap part 6 and the holder 5 can consequently be fixed fast and easily in the desired position.

Round the holes 2 of the matrix are arranged edge supports 9 forming peripheral upsets. These have the function to strap the tissue under the matrix when the matrix is strapped around a thigh, for instance, resulting in dome-shaped tissue cushions



being pressed up through the holes. These elevations simplify the perforation of the skin area by the needle, whereby the sensitivity reduces and the resorption of insulin is promoted.

- 5 The holes arranged in files are numbered corresponding to the days of the month, and as the thighs of both legs can be used for injection alternately, sixteen are enough. This means that every hole has two figures, where hole number 1 has also been given  
10 the number 16, hole number 2 also the number 17, etc. The remaining sixteenth hole is only for the 31st day in months with 31 days. The only thing a patient has to remember at the injection is the day of the month to be able to choose the right spot for injection.
- 15 As a result the injection comes on a new spot during one month's time and for the next month-intervals the matrix can be moved for instance half a file distance to the indication lines B or C, so that the spots for injection from the preceding interval  
20 will be protected by the matrix. In this way you will get intervals of three months, i.e. the same area of skin will be the object for injection first after three months, so that a guaranteed recovery of the tissue is achieved. If you move the matrix half a  
25 file distance upwards on the thighs you will get the same pattern of injection with spots for injection that have rested for three months.
- If the patient has to inject for instance twice daily, the left and right thighs should be used  
30 interactively.



PATENT CLAIMS

1. Matrix for injection mainly intended as auxiliary to avoid repeated injection on the same spot during a rather long period of time

characterized by

5 the fact that the matrix (1) consisting of elastic, bandshaped material, provided with a number of holes (2), mainly circular in shape, and that every hole (2) has at least one marking which indicates the reciprocal order of the holes (2), and that a fixation device (4) for loosable fixation of the matrix (1) around a part of the body, for example an arm or a leg, is attached to one or both ends of the matrix (1).

10

2. Matrix for injection according to patent claim

15 1

characterized by

the fact that the holes (2) are edgesupported on the backside of the matrix, the said supports forming peripheral upsets.

20 3. Matrix for injection according to patent claim  
1 or 2

characterized by

the fact that the holes (2) are numbered corresponding to the units of time of a certain period of time,  
25 for instance the days of a month.



4. Matrix for injection according to one or more  
of the above patentclaims

characterized by

5 the fact that the holes (2) are mainly placed  
symmetrically on the surface of the matrix (1).

5. Matrix for injection according to one or more  
of the above patentclaims

characterized by

10 the fact that the holes (2) are arranged in many  
files, symmetrical in relation to a median line (A),  
and that the matrix (1) is provided with indication  
lines (B,C) situated at half distance from the  
median line (A).

15 6. Matrix for injection according to one or more  
of the above patentclaims

characterized by

the fact that the matrix (1) is made of rubber,  
soft plastic or elastic, woven material.



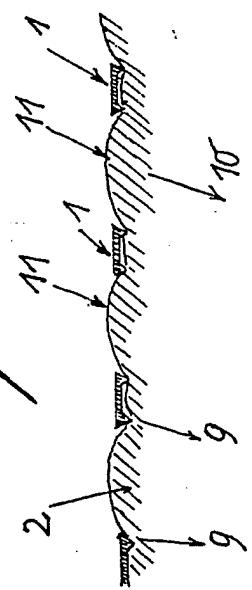
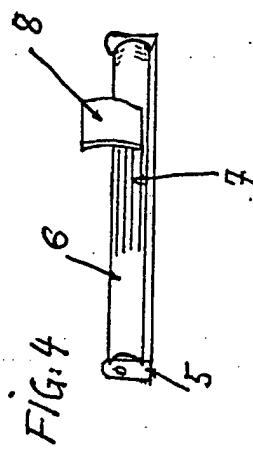
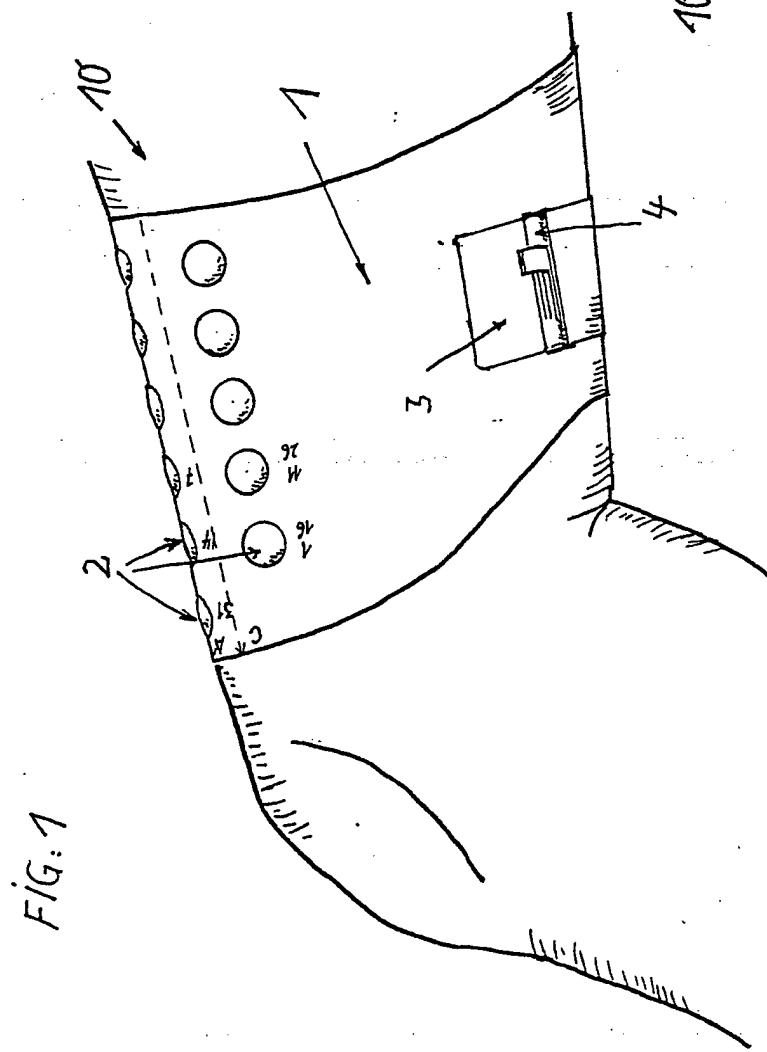
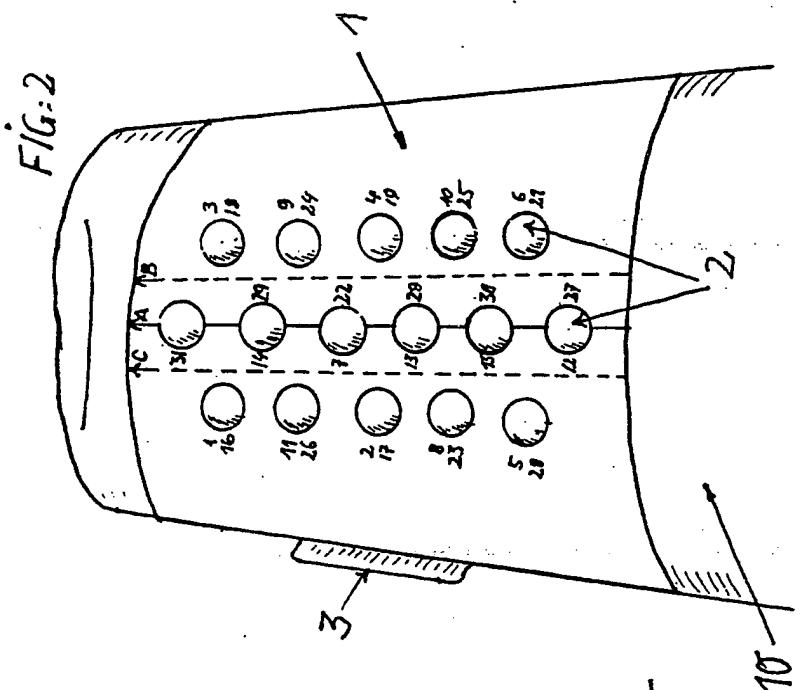


FIG: 2

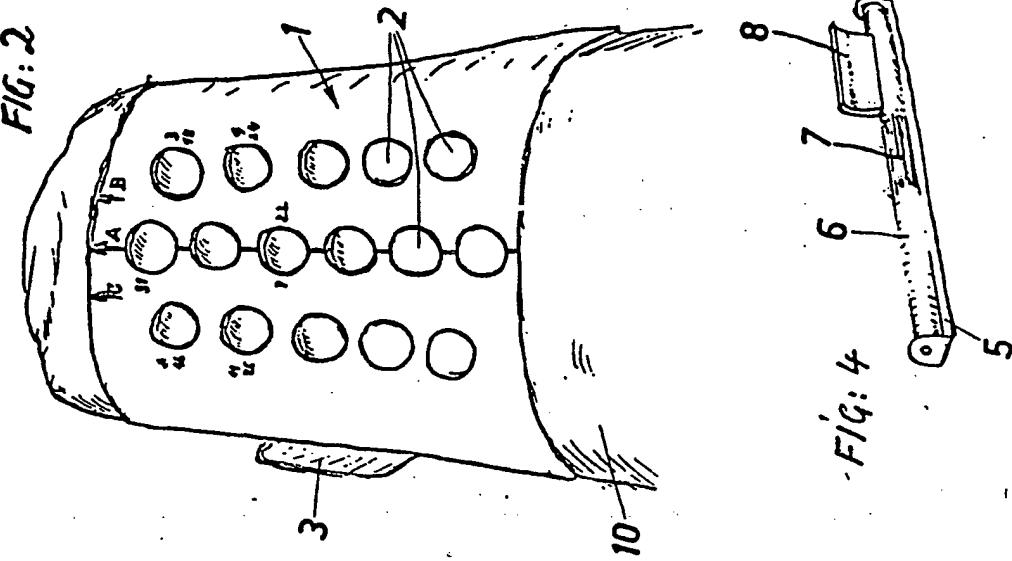


FIG: 1

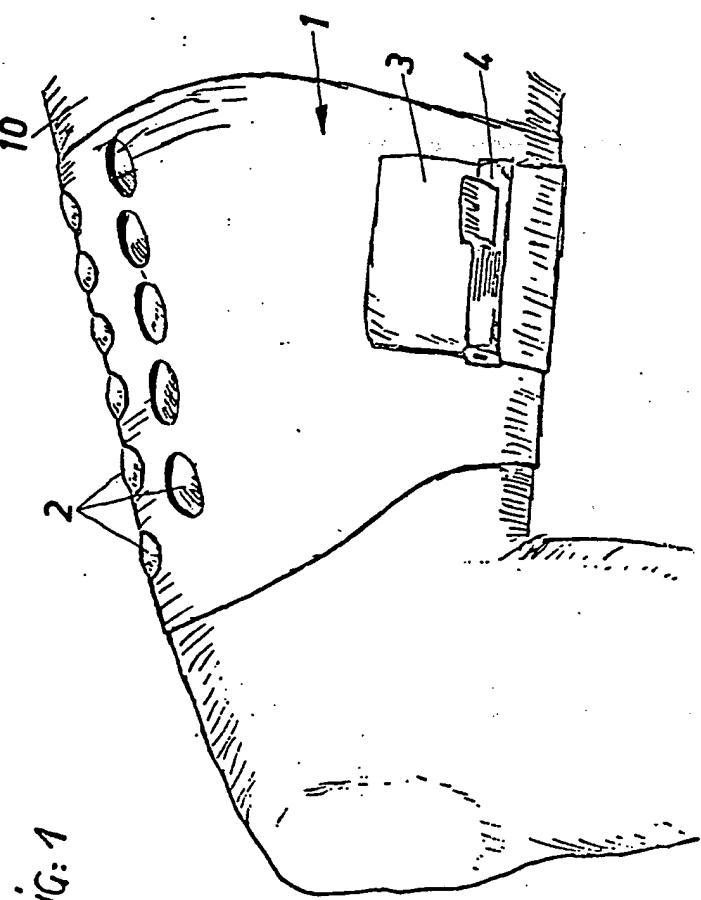


FIG: 4

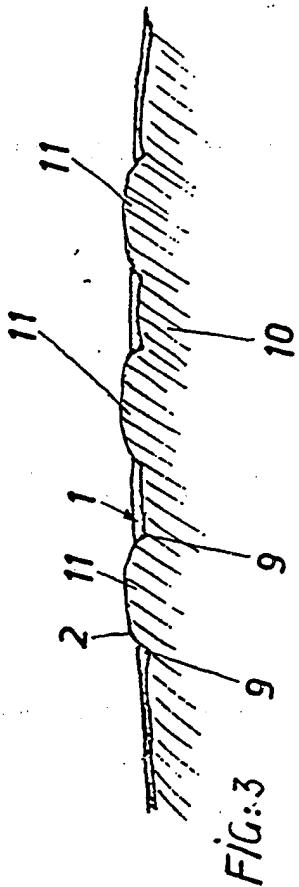
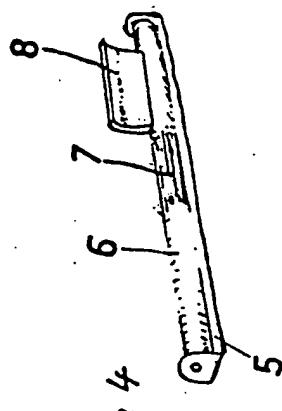


FIG: 3

# INTERNATIONAL SEARCH REPORT

International Application No PCT/SE79/00137

## I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) \*

According to International Patent Classification (IPC) or to both National Classification and IPC

A 61 M 5/00, A 61 G 12/00, G 09 F 7/00

## II. FIELDS SEARCHED

Minimum Documentation Searched \*

Classification System	Classification Symbols
IPC	A 61 B 10/00, 17/20; A 61 G 12/00; A 61 J 1/00, -7/00; A 61 M 5/00, 315; G 09 B 23/00, 28, 30; G 09 F 7/00
US Cl	35/17; 40/2, 125; 128/2W, R, 172, 172.2, 213, 214.2

Documentation Searched other than Minimum Documentation  
to the Extent that such Documents are Included in the Fields Searched \*

SE, NO, DK, FI classes as above

## III. DOCUMENTS CONSIDERED TO BE RELEVANT \*

Category *	Citation of Document, * <sup>10</sup> with indication, where appropriate, of the relevant passages * <sup>11</sup>	Relevant to Claim No. * <sup>12</sup>
A	DE, A, 2 444 379 published 1976, March 25, Baumgartner Erich Rudolf, Doehler Peter	1
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\* Special categories of cited documents: \*<sup>13</sup>

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## IV. CERTIFICATION

Date of the Actual Completion of the International Search \*

1979-08-29

Date of Mailing of this International Search Report \*

1979-09-06

International Searching Authority \*

Swedish Patent Office

Signature of Authorized Officer \*

*Nils Andersson*  
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